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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/553,776	04/21/2000	Venugopal Srinivasan	28049/36451	6850

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EXAMINER	
ODOM, CURTIS B	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/553,776	SRINIVASAN, VENUGOPAL	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/27/2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,8-13,22-24,26,29-34 and 36-38* is/are rejected.

7)☒ Claim(s) *4,6,7,14-21,25,27,28,35 and 39-41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 6/27/2005 have been fully considered but they are not persuasive. Claim 1 recites the limitation "encodes the signal to include the calculated entropy value". It is the understanding of the examiner that the entropy value included in the signal is an encoded bit integer representative of the actual calculated entropy value (see instant specification page 34, line 17-page 35, line 12). Therefore, the entropy value is represented in the signal as a bit or code. The actual calculated (probability) entropy is not included in the signal. At the decoder, the bit or code must be transformed to determine the actual calculated entropy value. Goertzen (previously cited in Office Action 12/17/2004) discloses that in entropy encoding, the amount of bits used to encode the signal is based on a probability (entropy) value (column 4, lines 33-47). The probability is sent to a code lookup table to find a code (length) matched for the probability, wherein the code is used to encode the signal. Furlan et al. (column 1, lines 36-46) further discloses that the entropy of the signal is represented as the code length of the signal (amount of bits used to encode the signal). An entropy can be transformed into a code length by simply locating the entropy value on a code (length) lookup table. Thus, by simply looking at the code length of a signal, the entropy value can be determined. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that since Goertzen in view of Furlan et al. also teach that the calculated entropy value is represented in the signal as

a bit or a code that the signal of Goertzen and Furlan et al. "encode the signal to include the calculated entropy value". Thus, the claims does not constitute patentability for this feature.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 5, 8-13, 22-24, 26, 29-34, and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goertzen (previously cited in Office Action 4/9/2004) in view of Furlan et al. (U. S. Patent No. 5, 652, 581).

Regarding claim 1, Goertzen discloses an encoder (Fig. 2, block 240) having an input and an output, wherein the input receives a signal, wherein the encoder calculates an entropy (column 4, line 33-column 6, line 44, wherein the amount of bits used to encode the signal based on a probability value is the entropy value) of at least a portion of the signal and encodes the signal to include data representative of the calculated entropy (column 6, lines, 14-16, wherein the characteristic of the bits used to calculate the probability at the decoder is data representative of the calculated entropy) and wherein the output carries the encoded signal.

Goertzen does not explicitly disclose the output signal (encoded signal) includes the calculated entropy value. However, Goertzen does disclose that in entropy encoding, the amount of bits used to encode the signal is based on a probability (entropy) value (column 4, lines 33-

47). The probability is sent to a code lookup table to find a code (length) matched for the probability, wherein the code is used to encode the signal. Furlan et al. (column 1, lines 36-46) further discloses that the entropy of the signal is represented as the code length of the signal (amount of bits used to encode the signal). An entropy can be transformed into a code length by simply locating the entropy value on a code (length) lookup table. Thus, by simply looking at the code length of a signal, the entropy value can be determined. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that since in entropy encoding, the code length of a signal represents a calculated entropy value, the calculated entropy value is included in the encoded signal by means of the code length.

Regarding claim 2, which inherits the limitations of claim 1, Goertzen and Furlan et al. do not disclose the signal is an audio signal. However, Goertzen does disclose the encoding scheme works for coding symbols in a symbol stream (column 2, line 65-column 3, line 11). An audio signal can include symbols in a symbol stream and it is also well known in the art that an entropy can be calculated and used for the encoding of an audio signal. Therefore, encoding an audio signal using a calculated entropy does not constitute patentability.

Regarding claim 3, which inherits the limitations of claim 1, Goertzen further discloses the encoder determines the entropy value based on a summation of probabilities (column 4, lines 33-47 and column 5, lines 31-44), wherein encoding using a probability for each symbol will result in a summation of probabilities for a stream of symbols.

Regarding claim 5, which inherits the limitations of claim 1, Goertzen further discloses the signal is encoded to preserve the entropy of the encoded portion of the signal (column 4, lines 33-54 and column 6, lines 4-20).

Regarding claim 8, which inherits the limitations of claim 1, Goertzen and Furlan et al. do not disclose the signal is coded to include the entropy value using frequency hopping. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order to transmit the encoded signal and preserve the entropy, the signal would have to be modulated and transmitted according to a particular scheme. The type of modulation scheme or transmission scheme is deemed a design choice and does not constitute patentability.

Regarding claim 9, which inherits the limitations of claim 1, Goertzen and Furlan et al. do not disclose the signal is encoded to include the entropy using spectral modulation. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order to transmit the encoded signal and preserve the entropy, the signal would have to be modulated and transmitted according to a particular scheme. The type of modulation scheme or transmission scheme is deemed a design choice and does not constitute patentability.

Regarding claim 10, which inherits the limitations of claim 1, Goertzen and Furlan et al. do not disclose the entropy value is calculated using histograms. However, it would have been obvious to one skilled in the art at the time the invention was made that a histogram could have provided the same entropy value as the calculation method of Goertzen. It is well known in the art that there are various ways to calculate an entropy. Thus, the method at which an entropy value is calculated is deemed as design choice and does not constitute patentability.

Regarding claim 11, Goertzen discloses a decoder (Fig. 3, block 340) having an input and an output, wherein the input receives a signal, wherein the decoder decodes the signal so as to read an entropy code from the signal (column 4, lines 33-54 and column 6, lines 4-20), and wherein the output carries a signal based upon the decoded entropy code.

Goertzen does not explicitly disclose the received (encoded) signal includes an entropy value. However, Goertzen does disclose that in entropy encoding, the amount of bits used to encode the signal is based on a probability (entropy) value (column 4, lines 33-47). The probability is sent to a code lookup table to find a code (length) matched for the probability, wherein the code is used to encode the signal. Furlan et al. (column 1, lines 36-46) further discloses that the entropy of the signal is represented as the code length of the signal (amount of bits used to encode the signal). An entropy can be transformed into a code length by simply locating the entropy value on a code (length) lookup table. Thus, by simply looking at the code length of a signal, the entropy value can be determined. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that since in entropy encoding, the code length of a signal represents a calculated entropy value, the calculated entropy value is included in the encoded signal by means of the code length.

Regarding claim 12, which inherits the limitations of claim 11, Goertzen and Furlan et al. do not disclose the signal is an audio signal. However, Goertzen does disclose the encoding scheme works for coding symbols in a symbol stream (column 2, line 65-column 3, line 11). An audio signal can include symbols in a symbol stream and it is also well known in the art that an entropy can be calculated and used for the encoding of an audio signal. Therefore, encoding an audio signal using a calculated entropy does not constitute patentability.

Regarding claim 13, which inherits the limitations of claim 11, Goertzen discloses the decoder determines the entropy value based on a summation of probabilities (column 4, lines 33-47 and column 5, lines 31-44), wherein decoding using a probability for each symbol will result in a summation of probabilities for a stream of symbols.

Regarding claims 22-24, 26, and 29-31 the claimed method includes features corresponding to subject matter mentioned in the above rejection of claims 1-3, 5, and 8-10 which is applicable hereto.

Regarding claims 32-34, the claimed method includes features corresponding to subject matter mentioned in the above rejection of claims 11-13 which is applicable hereto.

Regarding claim 36, which inherits the limitations of claim 32, Goertzen and Furlan et al. do not disclose the signal is decoded by determining swapping events, and wherein the swapping events correspond to swapping of a spectral amplitude of at least two frequencies in the signal. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order to receive and recover the encoded signal and determine the entropy, the signal would have to be demodulated according to the scheme at which signal was modulated and transmitted. The type of modulation/demodulation scheme or transmission/reception scheme is deemed a design choice and does not constitute patentability.

Regarding claim 37, which inherits the limitations of claim 32, Goertzen and Furlan et al. do not disclose the signal is decoded using frequency hopping. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order to receive and recover the encoded signal and determine the entropy, the signal would have to be demodulated according to the scheme at which signal was modulated and transmitted. The type of modulation/demodulation scheme or transmission/reception scheme is deemed a design choice and does not constitute patentability.

Regarding claim 38, which inherits the limitations of claim 32, Goertzen and Furlan et al. do not disclose the signal is decoded using spectral demodulation. However, it would have been

obvious to one of ordinary skill in the art at the time the invention was made that in order to receive and recover the encoded signal and determine the entropy, the signal would have to be demodulated according to the scheme at which signal was modulated and transmitted. The type of modulation/demodulation scheme or transmission/reception scheme is deemed a design choice and does not constitute patentability.

Allowable Subject Matter

4. Claims 4, 6, 7, 14-21, 25, 27, 28, 35, and 39-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
September 17, 2005

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